

Programmatic & Strategic Advancement of Science: PASAS Visualization Tool

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PASAS is an interactive & scalable portfolio visualization tool that incorporates a programmatic vision to accelerate the advancement of science

ABSTRACT

Advancement of basic scientific findings to real-world application takes time, resources and a long-term programmatic vision. We developed a flow-of-science framework that has enabled us to gain a better understanding of how to: 1) identify research projects with results that are ripe for advancement, and 2) better utilize existing programs and resources to streamline their advancement. As a proof-of-concept, a six-year retrospective analysis of funded, competing research project grants (FY2008-13; N=1,164) were analyzed from the four branches within NIDA's Division of Basic Neuroscience and Behavioral Research (DBNBR). Each Branch developed a theoretical flow of science that not only mapped the area of science addressed by a given grant, but that also encompassed a programmatic vision of where the science should progress in 5-10+ years. Then, each funded grant was binned into Branch-specific areas of science and further plotted across a harmonized, cross-cutting set of data elements that were chosen to reflect the most common research domains within DBNBR's portfolio. The resulting portfolio heat map is a click-able, interactive dashboard. The hyperlinked number in a given bin represents the number of grants (and the associated grant information, such as PI name, grant number, FOA, dollars, etc.) within that research area; the colorimetric data are used to indicate the level of financial resources underpinning those funded grants. This portfolio visualization tool provides a valuable at-a-glance assessment of a variety of useful information, including: gap analysis (i.e., a visual of resource-intense vs. resource-limited areas of science), trend analysis, resource summary data relevant for budget and policy-related inquiries, FOA evaluative reports for on-going programmatic evaluation, and a 'match-making' resource list to foster collaboration and training needs. In summary, this portfolio analysis and visualization tool provides a novel approach for the programmatic and strategic advancement of science.

GOALS

SHORT-TERM

- ID current gaps and opportunities
- ID areas ready for inter- or intra-Divisional advancement
- Inform Office of Science Policy & Communications

MID-TERM

- Encourage extramural collaborations
- Enhance extramural training opportunities
- Facilitate inter- & intra-Divisional collaboration

LONG-TERM

- Evaluate progress (or lack thereof) (e.g., FOAs)
- Recurrent analytical platform to inform future strategic directions

METHODS & APPROACH

- **Fig 1:** Overview and rationale
- Funded research project grants
 - R01, R21, R03, P01, U01, UH2, RC2, DP1, R56,
 - New, competing Type 1 or 2 RFPs only
 - FY 2008 – 2013 (inclusive)
- **Fig 2:** Create standardized 'Cross-cutting' classifications common to Division/ NIDA
- **Fig 2 & Suppl Figs:** Frame 'Areas of Science' unique to each Branch
- Harmonized data elements were iteratively produced via discussions with Branch Chiefs, Program Directors, and Division Director
- **Fig 2:** Grants were then scientifically coded according to these newly-defined data elements and these data were used to fill in four Branch-specific matrices
- **Figs 3A-D:** Analysis for financial data, trend analysis, scientific findings, publications, GPRA, data calls, etc.
- **Fig 4:** FOA Analysis for gaps, collaborations, etc.

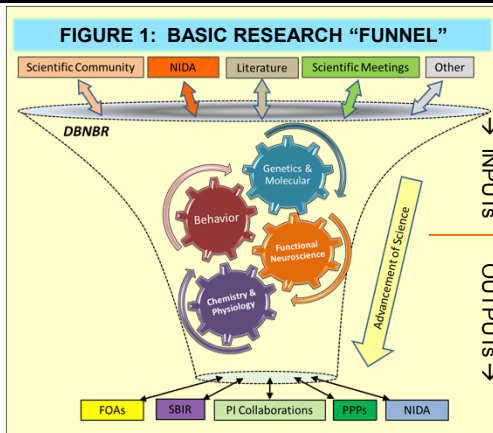
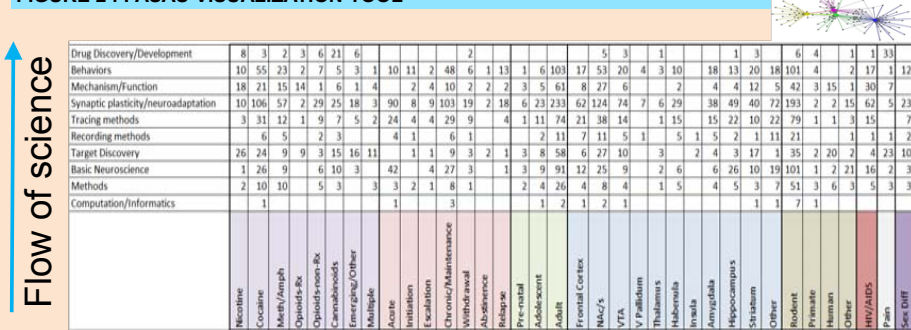


FIGURE 2 : PASAS VISUALIZATION TOOL



Harmonized cross-cutting elements

FIGURE 3 A-D: EXAMPLES OF OUTPUTS AND REPORTS

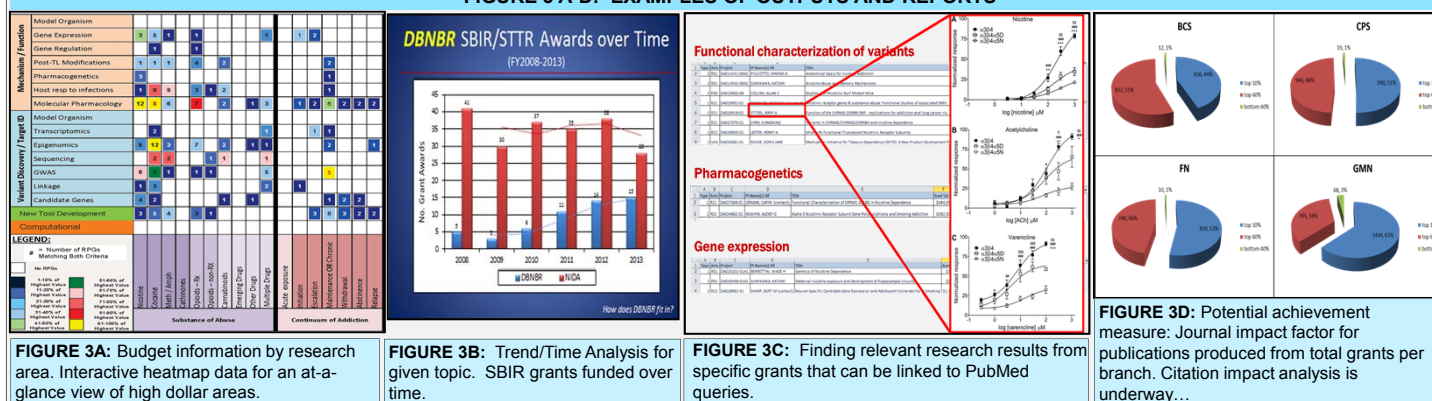


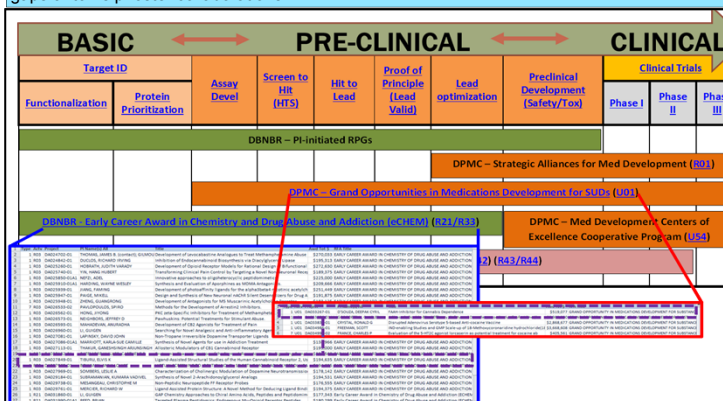
FIGURE 3A: Budget information by research area. Interactive heatmap data for an at-a-glance view of high dollar areas.

FIGURE 3B: Trend/Time Analysis for given topic. SBIR grants funded over time.

FIGURE 3C: Finding relevant research results from specific grants that can be linked to PubMed queries.

FIGURE 3D: Potential achievement measure: Journal impact factor for publications produced from total grants per branch. Citation impact analysis is underway...

FIGURE 4: FOA ANALYSIS. All FOAs were mapped onto a basic to clinical pipeline to identify gaps or to help foster collaborations.



SUMMARY & NEXT STEPS

PASAS is a scalable tool for visualizing the advancement of science by encompassing a programmatic vision for a given scientific area and relies on scientific expertise

Through this retrospective analysis we have established a proof-of-concept for development of an interactive portfolio visualization tool that is can be easily adopted.

This approach is useful for a variety of NIH scientific functions, such as:

- **SENIOR STAFF / LEADERSHIP / POLICY**
 - inform strategic directions,
 - query the IC's portfolio and compose accurate data reports as needed
- **REVIEW STAFF**
 - help devise IC-derived SRGs
- **PROGRAM STAFF**
 - interactive portfolio assessment
 - locate possible IC-funded collaborators
 - identify experts in a given field to hold workshops for gaps & opportunities
 - locate a possible mentors for new PIs/ESIs or Fellowships
 - Determine PI success (e.g. successful type 2s, moving from Fs to Ks to Rs, etc)

Future efforts are to implement this tool NIDA-wide and incorporate the cross-cutting and "flow of science" elements to our coding schema